

ABSTRACT

A field effect transistor of the present invention includes: a gate electrode formed on a substrate; a gate insulation layer formed on the gate electrode; a source electrode and a drain electrode that are formed on the gate insulation layer; a n-type semiconductor layer including carbon nanotube, 5 formed between the source electrode and the drain electrode so as to contact with the source electrode and the drain electrode; and a n-type modifying polymer layer formed on the n-type semiconductor layer, the n-type modifying polymer layer being for converting a polarity of the carbon nanotube from an original polarity of p-type into n-type and for stabilizing the polarity. The 10 semiconductor characteristics of CNT are converted concurrently with the formation of the semiconductor protective layer, whereby the manufacturing process can be simplified. Thereby, a CNT-FET circuit that is stable even in the air can be provided.